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UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE RO

REPLY TO: 3420 Pest Management Evaluations DATE: January 15, 1986

SUBJECT: White fir and incense-cedar mortality along the Rancheria Road (25S03), Greenhorn Ranger District (Report No. 86-1)

TO: Forest Supervisor, Sequoia National Forest

On October 16, 1985, FPM staff members Detlev Vogler (pathologist) and John Wenz (entomologist), accompanied by Chuck Silvis, Recreation Technician, examined two groups of dead trees along the Rancheria Road (25S03). Mortality group 1 is located on both sides of a bend in the road about 1/4 mile north of the old Shirley Meadows campground near the ski area (T. 25 S., R. 32 E., Sec. 32). Mortality group 2 is located five miles south of the first and about one mile north of the Sawmill Road turnoff; it is on the east side of a bend in the road that is about 1/3-mile north of the southwest section corner of section 18 (T. 26 S., R. 32 E.).

Mortality group 1 comprises two somewhat different conditions. West of the road is an approximately 250-ft. diameter opening surrounded by a stand of white fir, incense-cedar, ponderosa pine, and sugar pine. Pole-size and larger incense-cedar and some white fir have been dying around the periphery for several years. Although the opening appears to be a typical root disease center, there were few old stumps, and those that were examined showed no evidence of annosus root disease (caused by Fomes annosus). Laboratory isolations from the roots of dead fir and incense-cedar were also negative for F. annosus. Cedar bark beetles (Phloeosinus spp.) were found in some of the affected incense-cedar, but were responding to the weakened condition of the trees and were not the main cause of the problem.

East of the road, the mortality center is about 100 feet across and contains 15-25 dead incense-cedar of sapling through sawtimber size. The mortality group straddles a gentle drainage to the southeast, and the ground is very wet and marshy. Since no root or other pathogens were found to explain the condition, this mortality east of the road may have been caused by excessive moisture that depleted the roots' supply of oxygen. Cedar bark beetles were found in the affected incense-cedar here also, but the combination of an especially wet winter with changes in drainage patterns caused by road construction or other modifications could have predisposed the trees to attack.

According to Chuck Silvis, 1983 was the wettest year in the last nine. This is supported by weather records from Glennville and Kern River Power House No. 3, lower-elevation sites to the west and east of Greenhorn Summit. In fact, 1983 was considerably wetter than any year in the previous fifteen. Total precipitation at Glennville in 1983 was 39.7 inches, while the mean annual precipitation for 1968 through 1982 was 20.1 inches; at the Kern River Power House, 1983 precipitation was 28.3 inches, while the mean for the previous 15 years was 14.0 inches (Source: NOAA, Climatological Data Summary for California).

Mortality group 2 straddles a slight drainage to the southeast also, but the mortality there appears more related to annosus root disease -- in combination with the fir engraver (Scolytus ventralis) -- than to drainage patterns, although the conditions may be related. The mortality group is about 120 feet across and the dead trees are predominantly 18-24" dbh white fir. A few incense-cedars have died, but the pines are unaffected. Annosus conks were found in two 35-40 inch white fir stumps in the middle of the center.

In both mortality groups, white fir and incense-cedar have been dying for at least the last five years, and the rate of mortality does not appear to have increased recently. In mortality group 1, Fomes annosus, although its presence was not confirmed, may be involved in the slow enlargement of the larger opening; if it is, it has been killing trees slowly for many years. In the smaller portion of the group east of the road, where tree death seems to be associated with drainage problems, mortality should not spread beyond the affected area and may stabilize if moisture conditions change. Mortality group 2 is a typical annosus root disease center affecting mainly white fir, and appears to be enlarging very slowly. In all cases, pines are substantially unaffected.

Mortality of white fir and incense-cedar will likely continue at a slow pace in the root disease centers, which will enlarge at the rate of a foot or two per year, and pines may gradually claim a larger portion of the sites. If esthetic or other values in the roadside corridor warrant, pines or oaks may be planted to revegetate the centers. Catastrophic tree mortality and rapid center expansion is unlikely. Where excessive moisture and root death appear to be the primary problem, conifers will reestablish themselves only when the drainage patterns change or stabilize.

If you have questions regarding this report, contact either Detlev Vogler or John Wenz at (415) 556-6520.

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